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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 20, 2006

In Reply Refer To: WTR-7

Glenn Ishida, Plant Manager
Bay Area Circuits, Inc.
91 Winslow Street
Redwood City, California 94063

Re: April 4, 2006 Clean Water Act Inspection

Dear Mr. Ishida:

Enclosed is the November 20, 2006 report for our April 4 inspection of Bay Area Circuits. Please submit a short response to the findings in Sections 2 through 5 of this report, to EPA, the South Bayside System Authority, and the Regional Water Quality Control Board, by **February 28, 2007**.

The main findings are summarized below:

1 Bay Area Circuits qualifies as a printed circuit board manufacturer subject to Federal metal finishing standards for new sources. SBSA incorrectly classified and permitted Bay Area Circuits.

2 Treatment is both equivalent in design to the models used in setting the Federal standards and operated in a number of ways to perform better than predicted. Consequently, there have been no violations of the Federal standards for new sources even through the SBSA permit advanced the less stringent existing source standards.

3 The excess single-pass cooling water should be diverted downstream of the compliance sampling point.

I certainly appreciate your helpfulness extended to me during this inspection. I remain available to SBSA and to you to assist in any way. Please do not hesitate to call me at (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

Original signed by:
Greg V. Arthur
Greg V. Arthur
CWA Compliance Office

Enclosure

cc: Norman Domingo, SBSA
Michael Chee, RWQCB-Oakland

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U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User:	Bay Area Circuits, Inc. 91 Winslow Street, California 94063 40 CFR 433 – New Source Metal Finishing
Treatment Works:	South Bayside System Authority Regional Water Treatment Plant (NPDES Permit CA0038369)
Date of Inspection:	April 4, 2006

Inspection Participants:

US EPA:	Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504
RWQCB-Oakland:	None
SBSA:	Robert Chapman, Water Quality Specialist, (650) 594-8411 ex141
Bay Area Circuits:	Glenn Ishida, Plant Manager, (650) 367-8444 David Cerda, Environmental Compliance Mgr, (650) 367-8444

Report Prepared By:	Greg V. Arthur, Environmental Engineer November 20, 2006

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1.0 Scope and Purpose

On April 4, 2006, EPA, and the South Bayside System Authority ("SBSA") conducted a compliance evaluation inspection of Bay Area Circuits in Redwood City, California. The purpose was to ensure compliance with the Federal regulations covering the discharge of non-domestic wastewaters into the sewers. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct standards at the correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

Bay Area Circuits is a significant industrial user ("SIU") within the SBSA sewer service area whose compliance was assessed as part of an on-going EPA evaluation of industrial users in EPA Region 9 by sector. The inspection participants are listed on the title page. Arthur conducted the inspection on April 4.

1.1 Process Description

Bay Area Circuits is an independent manufacturer of multilayer, non-flexible printed circuit boards at 91 Winslow Street in Redwood City, California. The manufacturing steps include template film, board scrubbing, photo resist, resist strip, hole drilling, electroless-copper plating, copper plating, tin/lead plating, ammonium etching, solder reflow, leveling, mask and strip, and nickel/gold tab plating. Board lay-up is done off-site by the laminate supplier.

Surface Prep	• copper clad laminate board scrub – mechanical scrub • template film photo – fixer, developer • photo resist – silkscreen (glycol/surfactant) cleaning • photo resist strip – 2-butoxyethanol/ethanolamine resist strip, tin/lead strip • fabrication – cutting, routing boards to size, hole drilling
E-less Plating	• hole plating line – chemical debur, $KMnO_4$-hole desmear, H_2SO_4-acid activation, H_2SO_4-acid precondition, $Na_2S_2O_8$ (persulfate)/H_2SO_4-acid microetch, catalyst predip, palladium catalyst, electroless-copper plating, methanol-benzotriazinol anti-tarnish
Plating	• copper plating line – H_2SO_4/formic-acid clean, persulfate/H_2SO_4-acid microetch, H_2SO_4-acid activation, acid copper plating, H_2SO_4-acid dwell • acid tin/lead solder plating • HNO_3-acid rack stripping • gold tip plating line – NH_4HF_2-solder strip, chloride-Ni plate, CN-gold plate
Etching	• ammonium oxidation etching line
Solder	• solder line – ethylamine/K_2CO_3-solder mask developing, solder flux, hot-air solder leveling, HCl-acid cleaner, water dwell

Bay Area Circuits began operations in 1975 but has replaced many steps since then. Bay Area Circuits installed the etching line in 1996, the electroless hole plating line in 1994, and

the tin plating line in 2000. According to SBSA, Bay Area Circuits also replaced a wet-floor with a dry-floor and installed secondary containment throughout the entire shop in 1995. Bay Area Circuits discharges its non-domestic wastewaters to the Redwood City domestic sewers through a single sewer connection designated in this report by permit number as IWD-021001. Domestic sewage discharges through separate connections downstream of the industrial wastewater connection. ***See*** Appendix 1.

1.2 Facility SIC Code

Bay Area Circuits is assigned the SIC code for printed circuit boards (SIC 3672).

1.3 Facility Wastewater Sources

The printed circuit board manufacturing lines generate spents, rinses, and wash waters from the image developers and metal finishing steps, as well as cooling water overflow. The 2002 SBSA permit application provides a detailed list of the solution and rinse tanks on-site identified by tank number. ***See*** Appendix 1.

Spent Solutions – The imparted contamination from the processing of parts and the progressive drop in solution strength result in the generation of spent solutions. Most spent solutions including those from electroless copper plating are metered through on-site treatment for discharge to the sewers. Spent ammonium etchant, template film photo fixant, and various strippants are hauled off-site for disposal. The remaining solutions lose enough through drag-out for regeneration strictly through additions.

Hauled Off-site	Metered Feed to Treatment	Regenerated By Additions
ammonium etchant template film fixant tin/lead strippant HNO_3-acid rack strip	chemical debur $KMnO_4$-hole desmear H_2SO_4-acid activation H_2SO_4-acid precondition persulfate/acid microetch catalyst predip palladium catalyst electroless-copper plating anti-tarnish H_2SO_4/formic-acid clean persulfate/acid microetch H_2SO_4-acid activation solder mask developing solder flux HCl-acid cleaner glycol-silkscreen clean	acid copper plating tin/lead plating hot-air solder leveler solder strip chloride-nickel plate cyanide-gold plate
No Sewer Discharge	Discharged @ IWD-021001	No Sewer Discharge

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Running Rinses – Bay Area Circuits primarily employs conductivity-controlled overflow rinses and a few cascading-spray and static drag-out rinses. The drag-outs each return to their solution tanks as make-up. All other rinses discharge on demand through treatment.

On-Site Treatment		Returned as Make-Up
chem debur 1°overflow hole desmear 1°overflow acid activation 1°overflow acid precondition 1°ovrflw microetch 1°overflow Pd-catalyst 1°overflow eless-Cu plate 1°overflow acid-Cu plate 2°overflow acid-tin plate 2°overflow rack strip 1°overflow CN-gold plate DI-1°ovrflw	board scrub tailwater tin/lead strip spray NH_4-etch cascade spray solder mask develop spray solder strip cascade silkscreen clean spray film develop tailwater	eless-Cu plate 2°static acid-Cu plate 1°drag-out acid-tin plate 1°drag-out
Discharged @ IWD-021001		Not Discharged

Blowdowns – Single-pass cooling water is first used to cool the developers and etchers and then reused as make-up for rinsing. The single-pass cooling water drains to a 360-gallon holding tank from which the rinses are pumped. ***See*** Section 1.7 of this report.

Domestic Sewage – Domestic sewage discharges into the Redwood City sewer lateral through separate connections downstream of the industrial wastewater connection.

1.4 Facility Process Wastewater Composition

The following determinations of the composition of the wastewaters listed above in section 1.3 were determined strictly by interview, observation, and literature search. There were no sample results in the sample record for Bay Area Circuits specific to these wastewaters.

Process Wastewaters	Treatment Chemicals	Single-Pass Cooling
copper, lead, nickel, tin, zinc, cyanide, ammonia, chelating agents, palladium, stannic oxide, dissolved solids/resist, low pH, high pH, surfactants	caustic, sulfuric acid, sodium sulfide, polymer	city water background

1.5 Facility Process Wastewater Treatment

Bay Area Circuits operates an industrial wastewater treatment unit ("IWTU") that accepts all rinses, the metered feed of most spents, tail waters, and uncontaminated excess single-pass cooling water. All wastewaters discharged to the sewers are treated. ***See*** Appendix 1.

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Delivery – All rinse waters are hard plumbed to the treatment unit. Spent solutions are transferred by short-hosed portable pump to drums for metered feed into the treatment unit. ***See*** Section 1.7 of this report.

Treatment – Treatment consists of a flow-through IWTU designed to handle all process wastewater discharges to the sewers and two small filtering units for specific waste streams. Board scrub tail water discharges through a canister and cloth filter unit prior to entering treatment. Photo resist strippant circulates through a micro-screen filter to remove dissolved photo resist. The IWTU involves dechelation, hydroxide- and sulfide-metals precipitation, surge holding, polymer-aided flocculation, plate settling, and final holding. Solids from the plate settler fill a sludge holding tank which feeds a filter press. Filtrate returns to dechelation. The sludge holding tank contents are circulated back through the plate settler in order to improve floc formation through sludge contact. The dechelation and metals precipitation reaction tanks and the sludge holding tank are each 1,000 gallons. The surge holding tank and final holding tank are 1,500 and 200 gallons, respectively. ***See*** Section 1.7 of this report.

Residuals Handling – The process and treatment residuals are hauled off-site for disposal by the following companies.

Process and Treatment Residuals	Off-site Disposal	
industrial wastewater treatment unit – filter cake	haz	DeMenno Kerdoon
spent etchants and strippants	reclaim	Phibro-Tech
spent filters and canisters	haz	Univar
solder dross	reclaim	ECS Refining
spent photo developing fixant	reclaim	Photo Waste Recycling

Sewer Discharge and Compliance Sampling – The industrial wastewater treatment unit discharges to the sewers from the final holding tank through a sample box, designated in this report as IWD-021001. In 2001-2006, Bay Area Circuits discharged an average of 17,600 gallons per day ("gpd"). ***See*** Appendix 3 for a five-year summary of sampling.

Operational Controls – Bay Area Circuits incorporates a number of good operational controls that improve the reliability and performance of treatment. First, metals precipitation involves both hydroxide-metals precipitation (pH dependent / forms good floc), and sulfide-metals precipitation (better insolubility / forms hard-to-floc pin solids). Second, the surge tank prior to plate settling evens out the hydraulic loads thereby reducing surge spikes through settling. Third, Bay Area Circuits employs good pH and ORP metering for process control. Finally, spents metering is well controlled with limited authorization (operations supervisor or treatment unit operator) and recordkeeping.

1.6 POTW Legal Authorities

South Bayside System Authority – SBSA is a Joint Powers Authority comprised of the Cities of San Carlos, Belmont, Redwood City, and the West Bay Sanitary District, as member agencies. SBSA operates an EPA-approved pretreatment program as required by the State of

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California in the San Francisco RWQCB's Waste Discharge Requirements, No. R2-2001-012, reissued to SBSA in 2001 and serving as NPDES Permit No. CA0038369. As part of this, SBSA and the member agencies have established sewer use ordinances that apply to all industrial users in its sewer system. Under this authority, SBSA issued an industrial user permit to Bay Area Circuits, No. 02-1001 covering the sewer discharge from IWD-0201001.

1.7 Photo Documentation

Arthur took seven digital photos, saved under the file names *bayareacirc-1.jpg* through *bayareacirc-7.jpg*. Four are depicted here. The others were duplicates.

Photo: Cooling Water Delivery for Reuse/Overflow
Taken By: Greg V. Arthur
Date: 04/4/06

Photo: IWTU – Top of Plate Settling Unit
Taken By: Greg V. Arthur
Date: 04/4/06

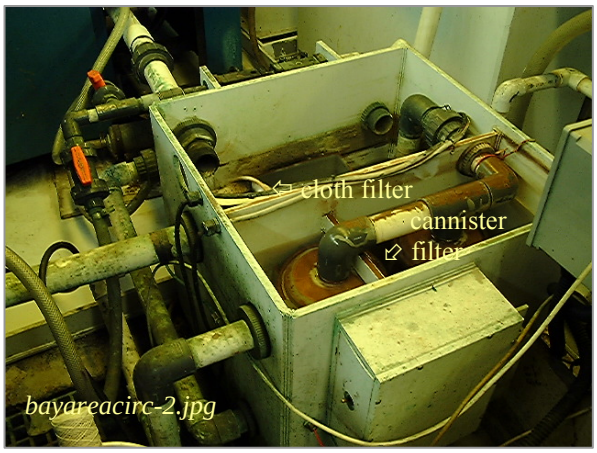

Photo: Board Scrub - Tail Water Filter Unit
Taken By: Greg V. Arthur
Date: 04/4/06

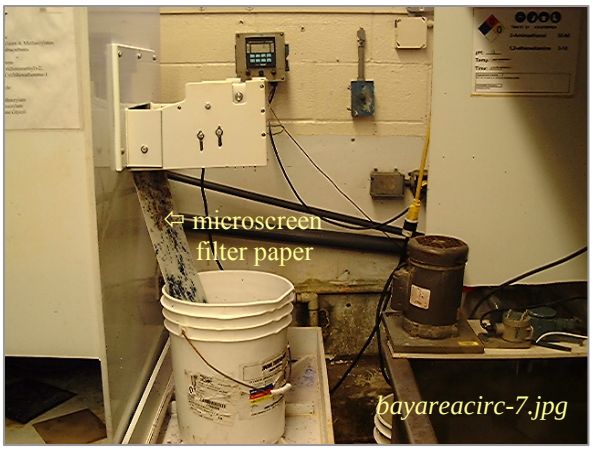

Photo: Photo Resist Strip - Micro-screen Filter
Taken By: Greg V. Arthur
Date: 04/4/06

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2.0 Sewer Discharge Standards and Limits

Federal categorical pretreatment standards (where they exist), national prohibitions, and the local limits (where they exist) must be applied to the sewered discharges from industrial users. (40 CFR 403.5 and 403.6).

Summary

The Federal categorical pretreatment standards for new source metal finishing in 40 CFR 433 apply to the process wastewater discharges from Bay Area Circuits through IWD-021001. The SBSA permit applied the local limits but misapplied the Federal standards for existing source independent printed circuit board manufacturers in 40 CFR 413. As a result, the SBSA permit does not accurately state the discharge requirements for Bay Area Circuits. The application of Federal categorical standards, national prohibitions, and local limits was determined through visual inspection and interview. ***See*** Appendix 2 for the sewer discharge standards and limits.

Requirements

- The Federal standards for new source metal finishing must be applied to the discharges through IWD-021001, as adjusted for dilution.
- The SBSA permit must not only prohibit dilution as a substitute for any treatment necessary to comply with Federal standards but also prohibit the bypassing of any treatment necessary to comply with either Federal standards or local limits.

Recommendations

- The cyanide-bearing wastewaters associated with gold tip plating should be sampled for compliance with the Federal cyanide standards, or the standards should be adjusted downward to account for dilution from non-cyanide bearing flows through IWD-021001.
- The excess single-pass cooling water should be diverted by hard pipe to discharge downstream of IWD-021001.

2.1 Classification by Federal Point Source Category

Bay Area Circuits qualifies as a printed circuit board manufacturer subject to the Federal metal finishing standards for new sources in 40 CFR 433. SBSA misclassified Bay Area Circuits as subject to the independent printed circuit board manufacturer standards for existing sources discharging more than 10,000 gallons per day. Federal standards are self-implementing which means they apply to regulated waste streams whether or not they are implemented in a local permit. The Federal rules in 40 CFR 403.6 define domestic sewage and non-contact wastewaters to be dilution waters.

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New or Existing Sources – Bay Area Circuits no longer is, and never was exclusively, subject to the Federal independent printed circuit board standards for existing sources in 40 CFR 413. Instead now it is required to comply with Federal new source standards. Under the definitions in 40 CFR 403.3(k), a process constructed at an existing source job-shop metal finisher after August 31, 1982 is a new source (1) if it entirely replaces a process which caused a discharge from an existing source or (2) if it is substantially independent of the existing sources on-site. This means new source standards apply to the original installation of the metal finishing lines, rebuilt or moved lines, or existing lines converted to do new operations. This also means that the new source standards generally do not apply to the piecemeal replacement of tanks for maintenance in otherwise intact metal finishing lines, nor do they apply to treatment upgrades without altering production. The preamble to the final 1988 Federal rule states that the new source standards apply when "an existing source undertakes major construction that legitimately provides it with the opportunity to install the best and most efficient production process and wastewater treatment technologies" (*Fed Register, Vol.53, No.200, October 17, 1988, p.40601*).

EPA understands that Bay Area Circuits removed and rebuilt all of its printed circuit board manufacturing lines involving chemical solution treatment in order to install secondary containment in 1995 or 1996. This qualifies as major construction that provided the opportunity to install the best and most efficient production process and wastewater treatment technologies. Furthermore, the nickel and gold plating line involved in tip plating always qualified solely under the metal finishing standards in 40 CFR 433 since tip plating was considered in the 1981 EPA Development Document to be a separate operation outside of the core printed circuit board lines. Finally, the main operations at Bay Area Circuits involving the etching line, the electroless hole plating line, and the tin plating line, which together account for the bulk of the wastewaters generated on-site, all were installed after 1994.

2.2 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and their receiving waters from adverse impacts. In particular, they prohibit discharges that can cause the pass-through of pollutants into the receiving waters or into reuse, the operational interference of the sewage treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. The national prohibitions apply nationwide to all non-domestic sewer discharges. The SBSA local limits apply to non-domestic discharges in the Redwood City service area.

Numerical Limits - The SBSA local limits for a number of toxic pollutants are annual mass averages to be compared to the average of the calculated daily-mass loadings for the previous 12 months. The SBSA permit for Bay Area Circuits advances annual mass average limits for arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, phenols, total cyanide, polycyclic aromatic hydrocarbons, and various toxic organics. The SBSA permit also advances numerical concentration limits for petroleum oil & grease, and numerical measurement limits for pH, and temperature.

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2.3 Federal Categorical Pretreatment Standards
New Source Metal Finishing - 40 CFR 433.17

40 CFR 433.17	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	CNa	TTO
daily-maximum (mg/l)	0.11	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
month-average (mg/l)	0.07	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Applicability - Under 40 CFR 433.10(a), the metal finishing standards apply to the process wastewaters from the new source metal finishing lines because the facility's operations involve printed circuit board manufacturing and tip plating (electroplating and solder strip etching). The metal finishing standards "... apply to plants that perform ..." the core operations of electroplating, electroless plating, etching, anodizing, chemical coating, or printed circuit board manufactur-ing and they extend to other on-site operations, such as cleaning, associated with metal finishing and specifically listed in 40 CFR 433.10(a). If any of the core operations are performed, the new source metal finishing standards apply to discharges from any of the new source core or associated operations. As a result, the metal finishing standards apply to all process wastewater discharges through IWD-021001.

Basis of the Standards - The new source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, no discharge of cadmium-bearing wastewaters, and if necessary, cyanide destruction and chromium reduction. The best-available-technology standards were set where metal finishers with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

Adjustments – Under 40 CFR 433.12(c), the cyanide standards as applied to metal finishing wastewater discharges must be adjusted to account for dilution from non-cyanide bearing waste streams (Federally-regulated and unregulated). At Bay Area Circuits, cyanide-bearing wastewaters are generated solely by the cyanide-gold plating line. As a result, the cyanide standards as applied to the discharges through IWD-021001 first must be adjusted proportionally downward to account for dilution from the non-cyanide bearing new source waste streams. EPA estimates the dilution at IWD-021001 to be ~13:1 simply based on the number of overflow rinses and tail waters with cyanide-bearing wastewaters. As a result, the metal finishing standards for total and amenable cyanide adjust downward to 0.092 and 0.050 mg/l daily-maximum and 0.066 and 0.025 mg/l monthly-average, respectively. A more sophisticated analysis might yield different results.

Under 40 CFR 403.6(d) and (e), the Federal standards need to be adjusted to account for dilution from non-contact wastewaters, defined by the rule as cooling waters, water preconditioning brines, or domestic sewage. The overflow of excess single-pass cooling water into the IWTU and through IWD-021001 would qualify as a dilution water. EPA has no estimate available for the amount of excess single-pass cooling water through IWD-021001. However, the proportional adjustment downward would be equal to the amount of total cooling water not drawn on-demand for rinsing by pump.

Compliance Deadline - New sources were required to comply on the first day of discharge.

2.4 Federal Prohibitions

The Federal standards in 40 CFR 403.6(d) and 403.17(d) prohibit dilution as a substitute for treatment, and the bypassing of any on-site treatment necessary to comply with standards, respectively. The SBSA permit advances a provision prohibiting dilution as a substitute for treatment. The permit does not include a provision against the bypassing treatment necessary to comply.

2.5 Point(s) of Compliance

The permit designates the SBSA monitoring box inside the facility, adjacent to the treatment area, and upstream of the facility domestic contributions, as the compliance point (designated in this report as IWD-021001).

Local Limits - Local limits and the national prohibitions apply end-of-pipe to all non-domestic flows from Bay Area Circuits. The sample point designated in this report as IWD-021001 is a suitable end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges.

Federal Standards - Federal categorical pretreatment standards apply end-of-process-after-treatment to all Federally-regulated discharges to the sewers. The sample point IWD-021001 is also a suitable end-of-process-after-treatment sample point representative of the day-to-day discharge of Federally-regulated wastewaters.

2.6 Compliance Sampling

The national prohibitions are instantaneous-maximums and are comparable to samples of any length including single grab samples. However, the local limits are mass loadings comparable to average loadings calculated from a year's worth of representative sampling of any length. Federal categorical pretreatment standards are daily-maximums comparable to 24-hour composite samples. The 24-hour composite samples can be replaced with single grabs or manually-composited grabs that are representative of the sampling day's discharge.

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3.0 Compliance with Federal Standards

Industrial users must comply with the Federal categorical pretreatment standards that apply to their process wastewater discharges. 40 CFR 403.6(b).

Categorical industrial users must comply with the prohibition against dilution of the Federally-regulated waste streams as a substitute for treatment. 40 CFR 403.6(d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

Summary

Bay Area Circuits employs wastewater treatment equivalent to the models used in originally setting the Federal standards. The treatment in-place is operated in ways that result in performance better than expected of metal finishers, because of dual sulfide/hydroxide precipitation steps, surge protection for settling, metered handling of spents, and good use of pH and ORP process control metering. So it is not surprising that Bay Area Circuits consistently complies with the Federal metal finishing standards for new sources in 40 CFR 4333 even though the permit misapplied the less stringent standards in 40 CFR 413. Adjustment of the Federal standards to account for dilution from excess cooling water is not be likely to affect compliance, and would only do so if dilution accounts for over 50% of the discharge through IWD-021001. All sampling results are useable for determining compliance. ***See*** Appendix 3.

Requirements

- None.

Recommendations

- None.

3.1 Sampling Results

The 2001-2006 sample record for Bay Area Circuits collected by SBSA from the monitoring box consists of quarterly sampling. All metals samples were 24-hour composites. All cyanide samples were grabs. All sample results are usable for determining compliance because they account for all discharged wastewaters. Bay Area Circuits is exempted from total toxic organics sampling because it operates under an approved toxic organics management plan, as set forth in 40 CFR 433. ***See*** item 5.0 of this report.

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3.2 Best-Available-Technology Treatment

The treatment in-place is equivalent in design and performance to the best-available-treatment (BAT) technology models used in originally setting the Federal standards. The BAT treatment incorporates a number of features that improve its performance by managing the variabilities inherent in wastewater generation, treatment, and discharge. BAT treatment at Bay Area Circuits is particularly improved by: (1) the metered handling of high-strength spent solutions, (2) both hydroxide and sulfide metals precipitation, (3) surge protection of the settling step, and (4) reaction end-point metering for pH and ORP. The sampling results indicate that Bay Area Circuits, as currently designed and operated, consistently complies with its Federal standards. All samples easily met all Federal standards, with all or nearly all samples below detection limits for cadmium, chromium, silver, and cyanide, and with average and calculated 99th% peak concentrations of 0.647 and 1.552 mg/l copper, 0.140 and 0.720 mg/l lead, 0.048 and 0.149 mg/l nickel, and 0.029 and 0.062 mg/l zinc.

3.3 Dilution as a Substitute for Treatment

The Federal standards in 40 CFR 403.6(d) prohibit "dilution as a substitute for treatment" in order to prevent compromising BAT model treatment with dilute waste streams. In particular, this prohibition applies when sample results for a diluted waste stream are below the Federal standards and the apparent compliance is used to justify discharge without treatment. There are two conditions that need to be established in order to make a determination of non-compliance with this prohibition. First, some or all of the Federally-regulated wastewaters must discharge without undergoing BAT model treatment or its equivalent. Second, there must be some form of excess water usage within a Federally-regulated process.

Bay Area Circuits does not meet either condition since all process-related wastewaters undergo on-site BAT treatment and all rinses are operated on-demand.

3.4 Bypass Provision

The Federal standards in 40 CFR 403.17 prohibit the bypassing of any on-site treatment necessary to comply with standards unless the bypass was unavoidable to prevent the loss of life, injury, or property damage, and there were no feasible alternatives. This provision explicitly prohibits bypasses that are the result of a short-sighted lack of back-up equipment for normal downtimes or preventive maintenance. It also explicitly prohibits bypasses that could be prevented through wastewater retention or the procurement of auxiliary equipment. It specifically allows bypasses that do not result in violations of the standards as long as there is prior notice and approval from the sewerage agency or State.

Bay Area Circuits has limited the possibility of bypassing treatment. In particular, the method of handling spents allows the use of short hoses with the portable pumps, thereby precluding the delivery of wastewaters to an improper disposal point. Bay Area Circuits also restricts handling of the spent solutions to the operations supervisor and the IWTU operator, thereby minimizing operational error.

4.0 Compliance with Local Limits and National Prohibitions

All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

Summary

Bay Area Circuits has the treatment capacity and capability to consistently comply with the local limits. Future local limits violations are unlikely because of the good treatment in-place and since the local limits are based on the historic peak month concentrations and historical annual average flow rate. ***See*** Appendix 3. Also ***see*** Sections 3.0 and 5.0 of this report.

Requirements

- None.

Recommendations

- None.

4.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

(1) cause operational interference with sewage treatment or sludge disposal,
(2) pass-through sewage treatment into the receiving waters or sludge,
(3) are in any way incompatible with the sewerage works, or
(4) do not improve the opportunities to recycle municipal wastewaters and sludge.

This inspection did not include an evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by the SBSA wastewater treatment plant through consistent compliance with their sludge and discharge limits.

4.2 Local Limits for Oxygen Demanding Pollutants and The National Prohibition Against Interference

The process-related wastewaters discharged to the sewers are not expected to be high enough in organics strength to pose a risk of interference, with wastewater strengths significantly less than domestic sewage.

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4.3 Local Limits for Toxic Metals, Cyanide, and Other Pollutants and The National Prohibition Against Pass-Through

There were no violations of the site-specific mass loading local limits for cadmium, copper, chromium, lead, nickel, silver, zinc, and cyanide. There were no sample results for surfactants, methylene chloride, chloroform, perchloroethylene, benzene, carbon tetrachloride, carbon disulfide, or petroleum oil and grease because the SBSA permit did not apply site-specific or unadjusted local limits for these pollutants. Concentrations much over the detection limits of the toxic organics would not be expected to be generated by Bay Area Circuits. The locally-regulated toxic organics are effectively addressed through the continued certification authorized in 40 CFR 433 of a toxics organics management plan in lieu of the required self-monitoring for toxic organics.

4.4 Flammability

Flammability would not be expected because the discharges to the sewer are expected to entrain only negligible amounts of volatile organics.

4.5 Local Limits for pH and Sulfides, and The National Prohibitions Against Safety Hazards and Corrosive Structural Damage

Sewer collection system interferences related to the formation of hydrogen sulfide and the resulting acidic disintegration of the sewers are not expected because the wastewaters discharged to the sewers are not high-strength in biodegradable organics, but are adjusted through the treatment to not be acidic in nature.

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5.0 Compliance with Federal Monitoring Requirements

Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).

Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) and 403.12(h).

Summary

The sample record for Bay Area Circuits does not involve self-monitoring but rather consists of only monitoring conducted by SBSA. All of the SBSA monitoring is representative of the overall discharge of treated wastewater from Bay Area Circuits over the sampling day as well as over the six-month reporting period.

Requirements

- None.

Recommendations

- None.

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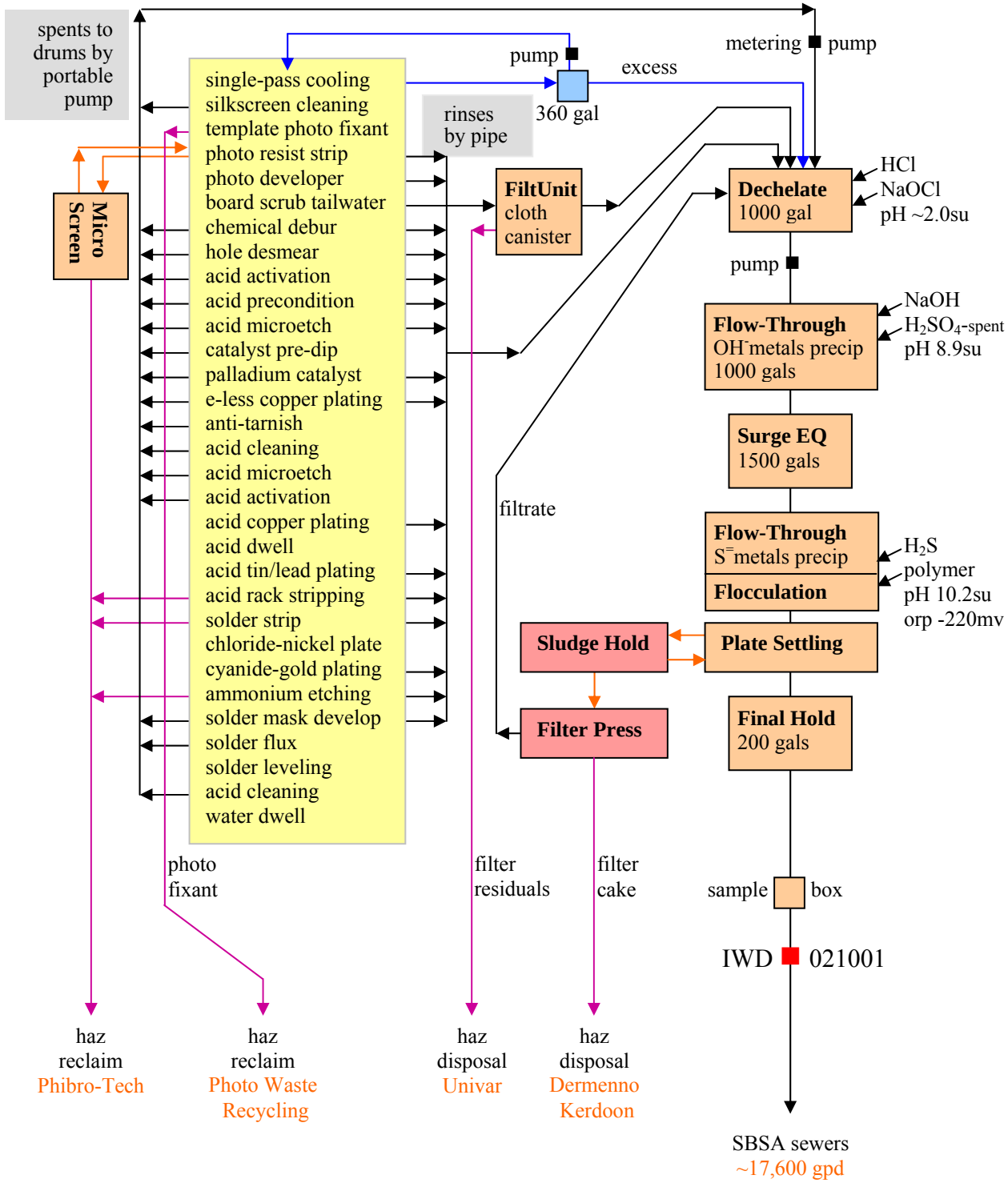
Appendix 1
Bay Area Circuits
Schematic of the Wastewater Collection and Treatment



Appendix 2
Sewer Discharge Standards and Limits
Bay Area Circuits @ IWD-021001

pollutants of concern (mg/l)	Fed categorical standards ⑦ (d-max)	(4d-avg)	local limits / nat'l prohibitions ⑤concentration-mg/l (instant)	(site-specific)	⑥load-lbs/d (12mo-av)	monitoring frequency IWD-021001
arsenic	-	-	0.1	-	0.018	③
cadmium	0.11	0.07	0.04	0.10	0.018	quarterly
chromium	2.77	1.71	0.2	0.643	0.120	quarterly
copper	3.38	2.08	0.2	2.661	0.490	quarterly
lead	0.69	0.43	0.2	2.057	0.380	quarterly
mercury	-	-	0.002	-	0.00037	③
nickel	3.98	2.38	0.06	0.2013	0.037	quarterly
silver	0.43	0.24	0.1	-	0.018	quarterly
zinc	2.61	1.48	1.0	-	0.180	quarterly
phenolics	-	-	2.3	-	0.480	③
total cyanide	0.092	0.050	0.06	-	0.011	quarterly
amenable cyanide	0.066	0.025	-	-	-	-
PAHs surfactants	-	-	0.2	-	0.037	③
methylene chloride	-	-	0.07	-	0.013	④
chloroform	-	-	0.03	-	0.0055	④
perchloroethylene	-	-	0.03	-	0.0055	④
benzene	-	-	0.002	-	0.00037	④
carbon tetrachloride	-	-	0.001	-	0.00018	④
carbon disulfide	-	-	0.008	-	0.0015	④
toxic organics	2.13	-	-	-	-	④
oil and grease – petro	-	-	100	-	18.43	③
flow (gpd)	-	-	-	-	-	quarterly
pH (s.u.)	-	-	6.0-9.5 ①	-	-	quarterly
explosivity	-	-	① ②	-	-	③
temperature (°F)	-	-	150°F	-	-	③

① National-prohibitions - Closed-cup flash point <140°F and pH <5.0 su.
② Narrative prohibition against the introduction of flammable or explosive substances
③ As part of periodic priority pollutant scans in order to identify changes in discharge quality
④ Twice per year solvent management plan self-certifications in lieu of self-monitoring
⑤ Site-specific concentration limits based on historical peak month concentrations
⑥ Loading limits based on historical average flow rates and highest local limit concentration
⑦ The Federal standards will adjust downward proportional to the amount of dilution water

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Appendix 3
Bay Area Circuits @ IWD-021001
January 2001 – January 2006

pollutants ② (µg/l)	effluent sampling results			violation rate ①			sample count	loading (lbs/yr)
	mean	99th%	max	sample	moav③	12-mo④		
cadmium	<10	<10	<10	0/16	0/16	0/5	16	<0.36
chromium	<30	<30	<30	0/16	0/16	0/5	16	<1.10
copper	647	1552	1360	0/16	0/16	0/5	16	23.76
lead	140	720	440	0/16	0/16	0/5	16	5.14
nickel	48	149	190	0/16	0/16	0/5	16	1.47
silver	<8	8	11	0/16	0/16	0/5	16	<0.29
zinc	29	62	57	0/16	0/16	0/5	16	1.07
total cyanide	<3	9	7	0/16	0/16	0/5	16	<0.11
total toxic organics	410	410	410	0/1	0/1	-	1	15.06
flow (gpd)	17644	28092	24572	0/16	-	-	16	-
pH (s.u.)	9.3 ⑤	- -	8.8 min 9.7 max	0/16	-	-	16	-

① There were no violations during this period.
② No sample results for the following pollutants of concern:
arsenic, mercury, phenolics, surfactants, oil & grease, explosivity, temperature
③ Monthly averages calculated by calendar month
④ Twelve-month average calculated by the rolling average of all samples from previous 12 months
⑤ pH median

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